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(71) Applicant: **Xerox Corporation**
Rochester,
New York 14644 (US)

(72) Inventors:
• **Swift, Joseph A.**
New York, NY 14519 (US)
• **Wallace, Stanley J.**
New York, NY 14564 (US)
• **Bullock, Roger L.**
New York, NY 14580 (US)

(74) Representative: **Jones, Helen M.M.**
Gill Jennings & Every LLP
Broadgate House
7 Eldon Street
London EC2M 7LH (GB)

(54) **Composite elements with controlled electrical conduction**

(57) Composite materials, methods for making and processing these materials, and systems for using the composite material are described. The disclosed composite material (or composite member) includes a plurality of continuous filaments (110) and can include fiber-like and/or particulate materials (124) incorporated within a binder polymer (134). For example, the composite member of filaments (110) can include fibril-shaped, semi-conductive elements (124) that are contained in a suitable binder polymer (134) to achieve a particular resistance value, wherein the filaments can be integrated and interlinked in a manner as to create an array of resistive elements that precisely define and control current flows through a device formed of the composite material. The composite member can therefore have resistive characteristics and, none or neglectably low amount of capacitive or inductive characteristics. The composite member can be used in market for electrical testing devices, e.g., as high performance, dynamic probes/sensors for very frequency and/or complex mixed-frequency signals.

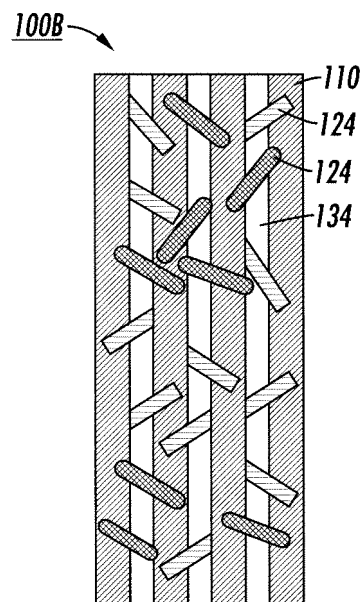


FIG. 1B



EUROPEAN SEARCH REPORT

Application Number
EP 09 10 0157

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	WO 2006/069140 A (INTEGRAL TECHNOLOGIES INC [US]; AISENBREY THOMAS [US]) 29 June 2006 (2006-06-29) * abstract * * page 3, line 4 - page 4, line 15 * * page 20, line 18 - page 21, line 6 * * page 26, line 1 - page 27, line 4 * * page 43, line 1 - page 44, line 9 * * page 46, line 5 - page 48, line 8 * * figures 5a,7 * * claim 1 * -----	1-3, 5-13,15 4,14	INV. C08J5/00 C08J5/04 C08J5/06 C08K3/04 C08K7/06 C08K7/24 C08K9/08 D01F9/127 D06M11/74 H01B1/24
X A	US 5 599 615 A (SWIFT JOSEPH A [US] ET AL) 4 February 1997 (1997-02-04) * claim 1 * * column 3, line 33 - line 37 * * column 7, line 8 - line 26 * -----	1,2,4, 9-11,15 3,5-8, 12-14	ADD. C08L63/02 C08L65/00 C08L79/02
X A	US 2008/020193 A1 (JANG BOR Z [US] ET AL) 24 January 2008 (2008-01-24) * abstract * * paragraphs [0002], [0005], [0007], [0008], [0019] - [0022], [0041] - [0043] * * figures 1(a),1(b),2,3 * * claims 1,6 * -----	1-3, 5-13,15 4,14	TECHNICAL FIELDS SEARCHED (IPC) B29B B29C C01B C08J C08K C08L D01F D06M G03G H01B H01H H01R
X A	WO 2007/130979 A (ROHR INC [US]; GOODRICH CORP [US]; KRUCKENBERG TERESA M [US]; HILL VAL) 15 November 2007 (2007-11-15) * abstract * * paragraphs [0002], [0004], [0011], [0021], [0027] - [0030], [0041] - [0072]; claims 1,37; examples 1-3 * ----- -/--	1-3, 5-13,15 4,14	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 September 2009	Examiner Meiners, Christian
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 09 10 0157

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 883 211 A (XEROX CORP [US]) 9 December 1998 (1998-12-09) * claims 1-10 * * column 7, line 8 - line 23 * * column 10, line 27 - line 39 * -----	1-13,15	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 September 2009	Examiner Meiners, Christian
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03-82 (P04C01)



Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1(part),2(part),3,5-8,9-11(all part),12-14,15(part)

A composite member according to claim 1 comprising a binder polymer, a plurality of discontinuous fibres, and conductive fillers to interlink the plurality of continuous filaments; a method according to claim 11 for providing such composites, optionally including pultrusion technologies.

2. claims: 1(part),2(part),4,9-11 (all part),15(part)

A composite member according to claim 1 comprising a binder polymer, a plurality of discontinuous fibres, wherein the binder polymer is conductive and comprises one or more conductive binder polymers to interlink the plurality of continuous filaments; a method according to claim 11 for providing such composites.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 10 0157

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-09-2009

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